This letter is responsive to the Office Action mailed on May 20, 2004. In that Office Action, claims 1-22 and 29-36 were examined, claim 8 was objected to as including a typographical error, claim 4 was rejected under 35 U.S.C. §112 as being indefinite, and claims 1-22 and 29-36 were rejected under 35 U.S.C. §103(a). Reconsideration of the application is respectfully requested in light of the above amendments and the following remarks.

Claim Amendments

Claim 8 is amended herein as suggested by the Examiner to correct a typographical error.

Claim 4 is amended herein to more definitely point out that the access patterns are the "intended input/output" described in claim 3.

Objection

The Examiner objected to claim 8. Applicants herein amend the claim as suggested by the Examiner. Therefore Applicants respectfully request the Examiner withdraw this objection.

Rejection under 35 U.S.C. §112

The Examiner rejected claim 4 indicating that the phrase "access patterns" is indefinite. While Applicants respectfully disagree with the Examiner's opinion, the Applicants herein amend the claim to more definitely point out that the access patterns are the "intended input/output" described in claim 3. Therefore Applicants respectfully request the Examiner withdraw this rejection.

Rejection under 35 U.S.C. §103(a) over U.S. Pat No. 6,289,375 in view of U.S. Pat. No. 5,408,644 and, for claim 15, in further view of U.S. Pat. No. 6,311,213

The Examiner rejected claims 1-14, 16-22 and 29-36 under 35 U.S.C. §103(a) over U.S. Pat No. 6,289,375 to Knight et al. (hereinafter "Knight") in view of U.S. Pat. No. 5,408,644 to Schneider et al. (hereinafter "Schneider). The Examiner further rejects claim 15 under 35 U.S.C. §103(a) over Knight, Schneider and U.S. Pat. No. 6,311,213 to Dawson et al. Applicants respectfully traverse these rejections.

In order to establish *prima facie* obviousness under 35 U.S.C. 103(a), three basic criteria must be met, namely: (1) there must be some suggestion or motivation to combine the references or modify the reference teaching; (2) there must be a reasonable expectation of success; and (3) the reference or references when combined must teach or suggest each claim limitation (Manual of Patent Examining Procedure 2142).

Applicants respectfully assert that the Examiner has failed to establish a *prima facie* case of obviousness because the references fail to disclose or suggest all of the limitations of the pending claims. Specifically, Applicants assert that the Examiner's interpretation of Knight's "refresh" and "discover" procedures and Knight's "attributes" are incorrect and that Knight does not in fact teach or disclose the elements as suggested by the Examiner. Applicants' further assert that neither Schneider nor Dawson teach or disclose the elements not taught by Knight.

U.S. Pat No. 6,289,375 to Knight et al.

Knight is directed to a system for <u>monitoring</u> a distributed storage network using a central manager and a plurality of independent local host computer systems having storage devices that make up the distributed storage network. <u>See</u>, Knight Col. 3, lines 24-54. The Knight system includes a local agent on each local computer system which provides data to the central manager.

As the Examiner noted in paragraph 9 of the Office Action, Knight is silent on mapping onto logical storage volumes onto storage devices. This is because Knight is directed to operations at the network level and presupposes that each host computer is pre-configured and operational. Knight is unconcerned with mapping logical volumes at the host computer level or how logical volumes are mapped except to the extent that such information is needed to monitor the network.

U.S. Pat No. 5,408,644 to Schneider et al.

Schneider is directed to a method of posting data to a storage device that reduces the time necessary to store the data. To achieve this, Schneider stores data in memory temporarily to maximize the posting process based on how the logical volumes of the storage devices are mapped. In some cases, Schneider creates a replica of a disk, including logical volumes in memory.

Except to the extent that there are logical volumes mapped to the storage devices, Schneider is silent on the mapping process and on what input information would be needed by a volume provider to map a logical volume to a storage device. Schneider presupposes mapped storage devices and uses the mapping information to maximize writing speed.

Claim 1 – Volume Provider Element

The Examiner cites Knight's Local Library 1001, Col. 18, lines 15-54, as disclosing a volume provider that presents an application programming interface (API). Applicants respectfully disagree. First, Knight's Local Library is not a volume provider as defined in the present invention on page 3, lines 1-4 as a tool for "mapping contiguous address space presented by the [logical] volume onto the non-contiguous storage address spaces of the underlying extents." Rather, Knight defines the Local Library as an intermediate system that provides data to the central manager and essentially services requests from the central manager for data. See, Knight Col. 18, lines 29-32 and Col. 19, lines 47-48. Second, Knight states that the Local Library has no API, but rather uses remote procedure calls to communicate with the central manager. See, Knight, Col. 18, lines 45-48 ("Local library 1001 communicates with the central manager through the operating system's remote procedure call facility 1014. In the preferred embodiment, facility 1014 handles all the interface details.").

The Examiner also cites Schneider as teaching a volume provider. However, Schneider only teaches mapping logical volumes to memory as part of a process of improving write speed by preventing partial stripe writes. Schneider discloses logical volume providers only inherently to the extent that one must have been used to initially map the disk arrays that store data.

Thus, for the reasons given above, Applicants believe that Knight and Schneider, either alone or in combination, do not teach or suggest a volume provider for mapping logical volumes as claimed. Therefore, as the Examiner has not shown at least this element of the claimed invention, Applicants respectfully request that the Examiner withdraw his rejection of this claim. Furthermore, as the dependent claims 2-11, 29 and 30 depend from claim 1, Applicants respectfully request allowance of claims 2-11, 29 and 30 as well.

Claim 1 – Behavioral Attributes Element

The Examiner cites Knight as teaching first behavioral attributes received from a first application (citing Knight's "Refresh" procedure) and second behavioral attributes from a second application (citing Knight's "Discover" procedure). Again, Applicants respectfully disagree. The citations provided by the Examiner describe a "Refresh" procedure and a "Discover" procedure, which are methods "whereby the central manager requests certain information of the agents located in various hosts in order to determine the configuration of storage networks in the current management set." Knight, Col. 30, lines 48-51. In Knight, the information returned is the actual information associated with the various host computer systems not desired behavioral attributes. As described in the present application on page 13, lines 10-21, desired behavioral attributes are an abstracted description of the desired performance characteristics of a logical volume on the storage system. The desired behavioral attributes represent an abstraction of from the actual attributes of the logical volume and need not correspond to specific explicit configurations or attributes of a logical volume.

Thus, for the reasons given above, Applicants believe that Knight and Schneider, either alone or in combination, do not teach or suggest desired behavioral attributes used to map a logical volume as claimed. Therefore, as the Examiner has not shown at least this element of the claimed invention, Applicants respectfully request that the Examiner withdraw his rejection of this claim. Furthermore, as the dependent claims 2-11, 29 and 30 depend from claim 1, Applicants respectfully request allowance of claims 2-11, 29 and 30 as well.

Claims 11, 21, and 31 – Configuring a Storage Volume

For the same reasons as described above with reference to claim 1, Applicants believe that Knight and Schneider do not disclose a volume provider or behavioral attributes as claimed in claim 11, 21 and 31.

Additionally, Applicants believe that Knight does not teach or disclose configuring a storage volume, which is an element in both claims 11 and 21. Examiner cites Step 1911 of Knight as an example of configuring a storage volume. However, inspection of Step 1911 shows that this step is a simple comparison operation in which the central manager "compares the attributes previously recorded for the device with the attributes obtained during the discover operation (step 1911)." Knight Col. 40, lines 28-30.

Furthermore, Schneider also does not disclose configuring a storage volume on an actual storage device, although Schneider does disclose creating a replica of a storage volume in memory.

Applicants do agree that the previously cited reference D'Errico does disclose configuring a storage volume. However, Applicants submit that none of the references cited so far in the prosecution of this application teach or disclose configuring a storage volume based on received behavioral attributes instead of received explicit volume attributes.

Thus, for the reasons given above, Applicants believe that Knight and Schneider, either alone or in combination, do not teach or suggest all of the elements of claims 11 and 21. Therefore, as the Examiner has not shown at least this element of the claimed invention, Applicants respectfully request that the Examiner withdraw his rejection of this claim. Furthermore, as the dependent claims 12-20 depend from claim 11, claim 22 depends from claim 21, and claims 32-36 depend from claim 31, Applicants respectfully request allowance of claims 12-20, 22 and 32-36 as well.

No Motivation to Combine

Finally, the Office Action attempts to reach the claimed subject matter by combining references, but does so without any teaching, suggestion, or motivation to do so other than applicants' own teachings, which is clearly impermissible by law. See, e.g., *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Applicants reiterate that the cited combination does not teach each limitation of the claimed invention, and moreover, submit that the Office Action identifies no teaching, suggestion or motivation to combine the references outside the general contention that the cited combination would achieve the subject matter recited in the claims. In addition, the Office Action does not indicate how the references could be combined to reach applicants' invention, how the combination could be accomplished, or even what might result from such a combination. Indeed, it appears that the Office Action, using impermissible hindsight based on applicants' teachings, simply located one reference dealing with receiving data from two applications, and another reference dealing with volume providers, in a failed attempt to reconstruct applicants' claimed invention.

Conclusion

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this Application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

_8/20/04_
Date

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